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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,596	08/06/2003	Naoya Hasegawa	9281-4617	1385

7590 11/25/2005

Brinks Hofer Gilson & Lione
P.O. Box 10395
Chicago, IL 60610

EXAMINER

KLIMOWICZ, WILLIAM JOSEPH

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/635,596	HASEGAWA, NAOYA	
	Examiner	Art Unit	
	William J. Klimowicz	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 10-15 is/are rejected.
- 7) ☒ Claim(s) 3 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of Specie I (corresponding to Figures 1-8) in the reply filed on November 9, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant maintains that claims 1-4 and 10-15 read on the elected embodiment. The Examiner concurs.

Claims 5-9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on November 9, 2005.

Specification

The disclosure is objected to because of the following informalities:

With regard to page 30 (line 12), the word "tack" should be changed to the word --track--

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 10-12, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Hasegawa et al. (US 2002/0069511 A1).

As per claim 1, Hasegawa et al. (US 2002/0069511 A1) discloses a giant magnetoresistive element comprising: a first antiferromagnetic layer (21); a pinned magnetic layer (22 or 26 or 27) formed on the first antiferromagnetic layer (21) so that the magnetization direction is pinned by an exchange coupling magnetic field with the first antiferromagnetic layer (21); a nonmagnetic material layer (23) formed on the pinned magnetic layer (22); a free magnetic layer (28) formed on the nonmagnetic material layer (23) so that the magnetization direction of a central portion (portion of (28) within region (E)) changes with an external magnetic field; nonmagnetic layers (e.g., 29b) formed on both side portions of the free magnetic layer (28) in the track width direction; ferromagnetic layers (30) formed on the respective nonmagnetic layers (29b); and second antiferromagnetic layers (31) formed on the respective ferromagnetic layers (30) to align the magnetization direction of each ferromagnetic layer (30) in a direction perpendicular to the magnetization direction of the pinned magnetic layer (22 or 26 or 27); wherein at least the free magnetic layer (28), the nonmagnetic layers (23) and the ferromagnetic layers (30) have continuous end surfaces at both sides in the track width direction - see FIGS. 1 and/or 2.

As per claim 2, wherein the ratio (FW/FL) of the dimension FW (D regions plus the single E region of layer (28)) of the free magnetic layer (28) to the dimension FL (the two D regions of layer portion (24b only)) of the ferromagnetic layers in the track width direction is 1.1 to 2.0 (which, as depicted in FIGS. 1 and/or 2 is 1.38).

Art Unit: 2652

As per claim 10, wherein each of the free magnetic layer (28) and the ferromagnetic layers (30) comprises any one of a NiFe alloy, Co, a CoFe alloy, a CoNi alloy, and a CoFeNi alloy - e.g., see, *inter alia*, paragraph [0123].

As per claim 11, wherein the free magnetic layer (28) and ferromagnetic layers (30) are made of the same magnetic material, and the thickness of the ferromagnetic layers (30) is smaller than that of the free magnetic layer (28 - e.g., see, *inter alia*, paragraph [0123].

As per claim 12, wherein each of the free magnetic layer (28) and ferromagnetic layers (30) comprises a single layer, and the free magnetic layer (28) or ferromagnetic layers (30), or both the free magnetic layer and ferromagnetic layers comprise a CoFeNi alloy - e.g., see, *inter alia*, paragraph [0123].

As per claim 14, wherein each of the nonmagnetic layers is composed of at least one of Ru, Rh, Pd, Ir, Os, Re, Cr, Cu, Pt, and Au - e.g., see, *inter alia*, paragraph [0123].

As per claim 15, wherein each of the first antiferromagnetic (21) and/or second antiferromagnetic layers (31) comprises a PtMn alloy, a X--Mn (wherein X is at least one element of Pd, Ir, Rh, Ru, Os, Ni, and Fe) alloy, or a Pt--Mn--X' (wherein X' is at least one element of Pd, Ir, Rh, Ru, Au, Ag, Os, Cr, Ni, Ar, Ne, Xe, and Kr) alloy - e.g., see, *inter alia*, paragraph [0130-131].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2652

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US 2002/0069511 A1) in view of Sasaki et al. (JP 2001-076323 A).

See the description of Hasegawa et al. (US 2002/0069511 A1), *supra*.

As per claim 13, Hasegawa et al. (US 2002/0069511 A1) does not expressly disclose wherein the free/ferromagnetic magnetic layer (28)/(30) comprises a laminate of a NiFe alloy layer and a CoFe alloy layer.

However, such laminated layers utilized in soft magnetic free layers of analogous giant MR sensors are well known. As just an example, Sasaki et al. (JP 2001-076323 A) discloses wherein a free/ferromagnetic magnetic layer (10) comprises a laminate of a NiFe alloy layer (10a) and a CoFe alloy layer (10b).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the free and ferromagnetic layers of Hasegawa et al. (US 2002/0069511 A1) with the laminated structure as set forth in claim 13, as taught by Sasaki et al. (JP 2001-076323 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the free and ferromagnetic layers of Hasegawa et al. (US 2002/0069511 A1) with the laminated structure as set forth in claim 13, as taught by Sasaki et al. (JP 2001-076323 A) in order to easily control magnetic distortion and provide excellence in production stability, as espoused by Sasaki et al. (JP 2001-076323 A) - see abstract of Sasaki et al. (JP 2001-076323 A).

Allowable Subject Matter

Claims 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

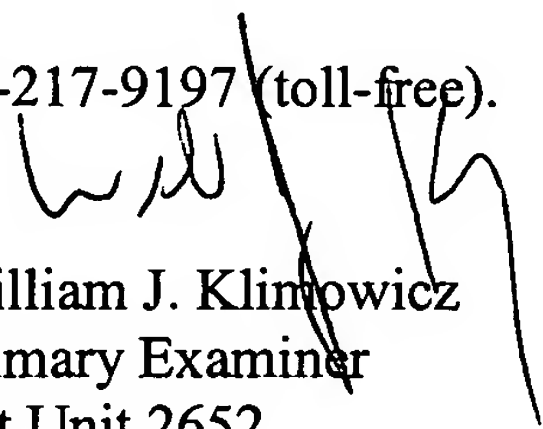
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (571) 272-7577. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, A. L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William J. Klimowicz
Primary Examiner
Art Unit 2652

Application/Control Number: 10/635,596

Page 7

Art Unit: 2652

A handwritten signature in black ink, appearing to be 'WJK', written in a cursive style.

WJK